

Appl. No. 10/709,710
Amdt. dated May 16, 2006
Reply to Office action of January 25, 2006

REMARKS/ARGUMENTS

5 This is a request for continued examination response to the Office action of January 25, 2006. Claim 1 has been slightly amended. Distinctions between at least claim 1 and 10 over the prior art are presented and reconsideration and allowance of claims 1-15 is respectfully requested.

1. Amendment to claim 1

10 Claim 1 has been slightly amended to correct a language error. In the previous Office action, a limitation of "an exhaust side of said exhaust fan facing said heating element". It is obvious from the illustrated air pathways shown in Fig.6 and Fig.7, paragraph [0022], and previous discussions of record that it is not "an exhaust side" of the exhaust fan that faces the heating element, but instead is an intake side of the exhaust fan that faces the heating element. Claim 1 has been corrected accordingly.

15 Additionally, a limitation that the heating element is disposed between the air duct and the exhaust fan has been added (Fig.6) merely support the balance of the claim. No new matter has been introduced. The applicant apologizes for the error and respectfully requests acceptance and entering of amended claim 1.

2. Claim rejections

20 Claims 1-10 and 12-14 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Ohishi et al (US 2002/0163627) in view of Fuse et al. (US 6,280,038). Claims 11 and 15 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Ohishi et al. in view of Fuse et al., and further in view of Bok (US 2002/0180938).

25 The Examiner has stated that Ohishi does not appear to disclose the claim 1 limitation of the air duct being "directly connected to" the input port and has provided the Fuse reference to support obviousness. The Examiner says "Fuse teaches providing an inlet

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of an air duct (see 95 of FIG. 1) being directly connected to an intake port (see 91 of FIG. 1)".

Referring to the Fuse reference, Col.3, lines 4-5 define element 95 of Fig.1 as "a duct to lead intake air to the ventilation unit 61". The applicant is unable to find any teaching
5 indicating that "duct 95" is directly connected to the intake port 91. In fact, in Fig.1, a fan 63 appears to be placed between the duct 95 and the intake port 91 making direct connection impossible.

The reasoning behind the claimed direct connection of the air duct to the input port
10 is to indicate that, in the present invention, there is no fan pushing air into the air duct. Instead, outside air is drawn through the input port into the air duct. The air duct guides the drawn air directly to the heating element. Near the heating element is an exhaust fan, which exhausts the drawn air heated by the heating element to the outside of the apparatus as is seen in Fig.6. The air exhausted outside the apparatus by the exhaust fan
15 creates a relatively low-pressure area inside the apparatus. The relatively low-pressure area draws more cool outside air in through the input port and duct to the heating elements, attempting to equalize the pressures.

Paragraph [0019] says that the drawn air changes the thickness of the thermal
20 boundary layer and increases the forced convection to enhance thermal transferring efficiency for cooling the heating elements. It is well known that differences in the speed of the air and the amount of turbulence in the air directly affect the thermal transferring efficiency of the system. A fan pushing the air into the duct (as does both Fuse and Ohishi) obviously would alter both of these values and provide a different thermal transferring
25 efficiency than a system that draws outside air into the duct with a fan that is located on another side of the heating element.

In some situations, it may be desirable to maximize the thermal transferring

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efficiency of a system. However, it is easily conceivable that in some situations this could lead to over-cooling and prevent a device from operating at the optimum temperature for which it was designed (Paragraph [0020]). Additionally, a second fan increases the noise and escaping light levels (and the cost), things that the present invention is attempting to
5 reduce (Paragraph [0021]).

Secondly, concerning the Examiner's comments about the range limitation found in claim 10, the Examiner is respectfully reminded that unless stated as drawn to scale in the specification, drawings may not be relied upon to know precise proportions and sizes (MPEP
10 2125). This would particularly seem true when Fig.9 of Ohsiki clearly illustrates that the disclosed projector is much larger than it may first appear. The present invention utilizes the range of 1-10 mm between the air duct and the heating element to ensure that heated air already within the apparatus does not preheat the drawn air before the drawn air reaches, and
15 cools the heating element.

In summary, the applicant asserts that the present invention as claimed is different than the references both structurally and functionally for at least the reasons explained above, and respectfully requests reconsideration and allowance of claims 1-15.

Appl. No. 10/709,710
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Sincerely yours,

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